REMARKS

Review and reconsideration on the merits are requested.

Formalities

Applicants appreciate the Examiner accepting the drawings filed May 9, 2007, acknowledging receipt of certified copies of the priority document (there is one priority document) and returning one initialed PTO/SB/08.

The Examiner correctly explains the situation regarding the Information Disclosure Statement at the top of page 2 of the Action.

Basis For Claim Amendment and New Claims

The amendment to claim 6 finds support at page 31, lines 17-18 in paragraph [0087] and lines 23-25 in paragraph [0088] (Example 6) of the specification.

In new claims 12 and 14 "wherein said sintered ferrite body has a maximum magnetic flux density of 520 mT or more measured at 100°C in a magnetic field of 1000 A/m" finds support at page 7, lines 27-29 in paragraph [0030] of the specification.

In new claims 13 and 15 "wherein said sintered ferrite body has a reduction ratio of a maximum magnetic flux density from 20°C to 100°C of 10% or less" finds support at page 8, lines 26-29 in paragraph [0033] of the specification.

The Prior Art

WO 2004/063117 (U.S. 7,481,946 Takagawa et al (Takagawa) being taken as a translation of WO 2004/063117); JP 06-290926 (JP '926).

The Rejection

All claims were rejected under 35 U.S.C. § 103(a) as being unpatentable over WO 2004/063117 (hereafter simply referred to as Takagawa, the U.S. patent) in view of JP '926.

The above rejection is respectfully traversed.

Applicants' traversal is set forth below; the Examiner's position is set forth in the Action and will not be repeated except as necessary to an understanding of Applicants' traversal.

Traversal

In the claimed invention, the ratio R (%) of Fe^{2+} to the total amount of Fe in the sintered ferrite body, and R_{cal} determined by the formula of $R_{cal} = [200(X-50)]/(3X)$ must meet the condition $R_{cal}-2.0 \leq R \leq R_{cal}+0.3$.

Because Fe^{2+} has positive magnetic anisotropy, opposite to ions of the main components such as Fe^{3+}, etc., with different temperature dependency, the existence of Fe^{2+} affects the temperature characteristics of initial permeability, etc. (for instance, the secondary peak temperature shift). Also, the existence of Fe^{2+} affects the electric resistance of ferrite.

The inventors found that the amount of Fe^{2+} has a great influence on the maximum magnetic flux density as well as on the temperature characteristics of initial permeability (see paragraph [0039] of the specification).

The ratio R is controlled by the following factors A to D:

A: Composition, particularly the amount of Fe^{2+};

B: Spinelization ratio of ferrite powder after calcining;

C: Amount V of the binder added; and

D: Oxygen concentration in the atmosphere from the binder-removing step to the completion of the sintering step being 0.1% or less by volume (see paragraphs [0019] and [0049] of the specification).

Takagawa is silent as to any of B-D above recited.

In the present invention, the factor D is very important in the method for producing the sintered ferrite body of claim 1. Specifically, the condition "the oxygen concentration in the atmosphere from the binder-removing step to the completion of the sintering step being as low as 0.1% or less by volume" makes it possible to sufficiently achieve the necessary reducing action of the binder (see paragraph [0080] and Table 5 of the specification).

The Examiner is requested to note that the term "from the binder-removing step to the completion of the sintering step" mentioned above is explained in paragraph [0048] of the specification.

Takagawa teaches a sintered Mn-Zn ferrite comprising 62-68 mol % of Fe_2O_3, 12-20 mol of ZnO, and the balance being MnO (see the Abstract of Takagawa).

Takagawa fails to specifically teach the spinelization ratio of ferrite powder after calcining and the atmosphere at the starting of the binder-removing step. Takagawa merely teaches the atmosphere at calcining, though Takagawa does teach the use of PVA as a binder (see col. 10, lines 30-32 and col. 11, 34-36 in view of, for instance, col. 15, lines 53-54 in Example 1 of Takagawa). Accordingly, insofar as the disclosure of Takagawa is concerned, Takagawa does not specifically identify the calcining atmosphere or the spinelization ratio of the ferrite powder after calcining. This is a substantial defect in the teaching of Takagawa as applied to the claims of the present application.

Since the spinelization ratio will be changed as the composition of the calcining atmosphere and the calcining conditions change, even if Takagawa might suggest the use of N_2 or atmospheric air for the calcining atmosphere, this suggestion would present insuffecient information to enable one or ordinary skill in the art determine the spinelization ratio of the ferrite powder after calcining.

In the present invention, a sintered ferrite body having the ratio R (%) of Fe2+ to the total amount of Fe as claimed in claim 1 can be obtained by the use of a controlled amount of the binder and maintaining the oxygen concentration in the atmosphere from the binder-removing step to the completion of the sintering step at 0 1% or less by volume

In contrast to the present invention, Takagawa, as discussed above, fails to teach the spinelization ratio of ferrite powder after calcining and also fails to teach the addition amount of the binder must be controlled and the oxygen concentration in the atmosphere **from the binder-removing step to the completion of the sintering step must be controlled** (bolding added).

Considering all of the teaching of Takagawa above-discussed, Applicants respectfully submit that one of ordinary skill in the art, taking the total teaching of Takagawa, would not find factors B to D obvious, which factors are necessary for controlling the ratio R (%) of Fe^{2+} to the total amount of Fe in the sintered ferrite body.

As a consequence, claim 1 of the present application is not obvious over Takagawa.

Applicants wish to strongly emphasize that the above differences in the process conditions of Takagawa from the present invention would be reflected in the sintered Mn-Zn ferrite produced, which should have a ratio R (%) of Fe^{2+} to the total amount of Fe completely different from that defined in the present invention.

As the following discussion will make clear, JP '926 does not remedy the defects of Takagawa.

Thus, as a consequence, Takagawa cannot reasonably teach to one of ordinary skill in the art the ratio R (%) of Fe^{2+}.

As will now be explained, JP '926 does not remedy this defect of Takagawa.

JP '926 discloses that there is to be added to a Mn-Zn ferrite magnetic material powder mainly composed of 10-87 wt% of Fe_2O_3, 10-50 wt% of MnO, and 3-40 wt% of ZnO the following components: 0.005-0.100 wt% of SiO_2, 0.010-0.500 wt% of CaO, 0.010-0.500 wt% of TiO, 0.005-0.100 wt% of V_2O_5, and 0.005-0.100 wt% of Nb_2O_5.

It is further appropriate to consider the fact that the mixture of powders is fired at a temperature in the range of 800 to 1200°C into a fired body of a density of 4.8g/cm^3 or more in fired density, whereby a low-loss Mn-Zn ferrite can be obtained at a low burning cost (see Abstract of JP '926).

Further, JP '926 teaches the use of 1 wt% of PVA as a binder in paragraph [0018] and the oxygen concentration in the atmosphere in paragraph [0013].

The oxygen concentration in the sintering atmosphere of JP '926 is different from that of the present invention and JP '926 is silent as to the calcining atmosphere.

Applicants wish to emphasize at this point that the composition of the sintered Mn-Zn ferrite magnet of JP '926 is different from that of the present invention in the units used to describe the same, that is, the composition JP '926 is expressed in wt%, while the composition of the claimed invention is expressed in mol%.

Specifically, 71.0 wt% of Fe_2O_3, 23.0 wt% of MnO_2 and 6 wt% of ZnO used in Example 1 of JP '926 correspond to 59.3 mol% of Fe_2O_3, 35.3 mol% of MnO_2 and 5.4 mol% of ZnO, respectively.

Thus, 59.3 mol% of Fe_2O_3 of JP '926 falls outside the range of 63-80% by mol of Fe_2O_3 as claimed in claim 1 of the present application.

As a consequence, even if Takagawa and JP '926 are combined, one of ordinary skill in the art could not find the limits of the claims herein obvious.

Applicants thus respectfully submit that one of ordinary skill in the art even further referring to JP '926 would not find factors A to D, the factors necessary for controlling the ratio R (%) of Fe^{2+} to the total amount of Fe in the sintered ferrite body, to be obvious.

Accordingly, the claims herein are not obvious over Takagawa in view of JP '926.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

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